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APPLICATION NO.	FILING DATE	FIRST NAMED INVENTOR	ATTORNEY DOCKET NO.	CONFIRMATION NO.
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10/719,431

11/21/2003

Kjell Kristoffersen

137682 (553-1053)

3956

45436

7590

11/06/2008

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EXAMINER

MEHTA, PARIKHA SOLANKI

ART UNIT

PAPER NUMBER

3737

MAIL DATE

DELIVERY MODE

11/06/2008

PAPER

**Please find below and/or attached an Office communication concerning this application or proceeding.**

The time period for reply, if any, is set in the attached communication.

<b>Office Action Summary</b>	<b>Application No.</b> 10/719,431	<b>Applicant(s)</b> KRISTOFFERSEN ET AL.	
	<b>Examiner</b> PARIKHA S. MEHTA	<b>Art Unit</b> 3737	

-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --

### Period for Reply

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) OR THIRTY (30) DAYS, WHICHEVER IS LONGER, FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133). Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

### Status

- 1) ☒ Responsive to communication(s) filed on 29 June 2007.
- 2a) ☐ This action is **FINAL**.                      2b) ☒ This action is non-final.
- 3) ☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

### Disposition of Claims

- 4) ☒ Claim(s) 1-27 is/are pending in the application.
- 4a) Of the above claim(s) \_\_\_\_\_ is/are withdrawn from consideration.
- 5) ☐ Claim(s) \_\_\_\_\_ is/are allowed.
- 6) ☒ Claim(s) 1-27 is/are rejected.
- 7) ☐ Claim(s) \_\_\_\_\_ is/are objected to.
- 8) ☐ Claim(s) \_\_\_\_\_ are subject to restriction and/or election requirement.

### Application Papers

- 9) ☒ The specification is objected to by the Examiner.
- 10) ☐ The drawing(s) filed on \_\_\_\_\_ is/are: a) ☐ accepted or b) ☐ objected to by the Examiner.  
Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).  
Replacement drawing sheet(s) including the correction is required if the drawing(s) is objected to. See 37 CFR 1.121(d).
- 11) ☐ The oath or declaration is objected to by the Examiner. Note the attached Office Action or form PTO-152.

### Priority under 35 U.S.C. § 119

- 12) ☐ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).
- a) ☐ All    b) ☐ Some \*    c) ☐ None of:
1. ☐ Certified copies of the priority documents have been received.
  2. ☐ Certified copies of the priority documents have been received in Application No. \_\_\_\_\_.
  3. ☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).

\* See the attached detailed Office action for a list of the certified copies not received.

### Attachment(s)

- |  |   |
|--|---|
| 1) <input type="checkbox"/> Notice of References Cited (PTO-892)                     | 4) <input type="checkbox"/> Interview Summary (PTO-413)           |
| 2) <input type="checkbox"/> Notice of Draftsperson's Patent Drawing Review (PTO-948) | Paper No(s)/Mail Date. _____                                      |
| 3) <input type="checkbox"/> Information Disclosure Statement(s) (PTO/SB/08)          | 5) <input type="checkbox"/> Notice of Informal Patent Application |
| Paper No(s)/Mail Date _____  | 6) <input type="checkbox"/> Other: _____                          |

## **DETAILED ACTION**

### ***Continued Examination Under 37 CFR 1.114***

1. A request for continued examination under 37 CFR 1.114, including the fee set forth in 37 CFR 1.17(e), was filed in this application after final rejection. Since this application is eligible for continued examination under 37 CFR 1.114, and the fee set forth in 37 CFR 1.17(e) has been timely paid, the finality of the previous Office action has been withdrawn pursuant to 37 CFR 1.114. Applicant's submission filed on 29 June 2007 has been entered.

### ***Specification***

2. The title of the invention is not descriptive. A new title is required that is clearly indicative of the invention to which the claims are directed.

The following title is suggested: Ultrasound probe circuitry and method for decoupling a receive section during operation of a transmit section.

3. The specification is objected to for the following minor informalities: the docket numbers listed under continuing data on the first page should be removed.

### ***Claim Objections***

4. Claims 6, 7, 15, 16, 20 and 22-27 are objected to because of the following informalities:

In line 1 of claim 6, "back-to back" should be corrected to read "back-to-back".

Claims 6 and 7 refer to "multiple transducer elements" wherein it is not clear whether these elements are the same elements set forth in the preamble of claim 1. If the elements of 6 and 7 are in fact the elements of claim 1, it is not clear whether claims 6 and 7 are then directed to a combination of a transducer and circuitry, rather than the subcombination of circuitry set forth by claim 1.

Claims 15 and 16 recite "multiple transducer elements" wherein it is not clear whether these elements are the same elements previously set forth in claim 10.

Claim 20 recites "the receive aperture" without proper antecedent basis.

Claims 22-27 fail to further limit the steps of the claimed method.

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Appropriate correction is required.

***Claim Rejections - 35 USC § 103***

5. The following is a quotation of 35 U.S.C. 103(a) which forms the basis for all obviousness rejections set forth in this Office action:

(a) A patent may not be obtained though the invention is not identically disclosed or described as set forth in section 102 of this title, if the differences between the subject matter sought to be patented and the prior art are such that the subject matter as a whole would have been obvious at the time the invention was made to a person having ordinary skill in the art to which said subject matter pertains. Patentability shall not be negated by the manner in which the invention was made.

6. Claims 1-27 are rejected under 35 U.S.C. 103(a) as being unpatentable over Peterson (US Patent No. 6,050,945), hereinafter Peterson ('945), in view of Moore et al (US patent No. 6,511,432), hereinafter Moore ('432), both previously of record.

**Regarding claims 1 and 21-23**, Peterson ('945) teaches an ultrasound method and probe, the probe including a transmit section input, a transmit section output, receive signal blocking circuitry between the transmit section input and transmit section output, a receive section input, a receive section output, and transmit signal blocking circuitry between the receive input and output (col. 5 lines 8-20), the transmit signal blocking circuitry including a coupling capacitor capable of decoupling the receive section during operation of the transmit section.

Peterson ('945) does not teach a coupling capacitor capable of decoupling the receive section during operation of the transmit section. In the same field of endeavor, Moore ('432) teaches a blocking capacitor 60 is effective to shield the receive circuit processing elements from potentially damaging high voltage transmit signals (col. 2 lines 6-15, col. 4 lines 36-43). It would have been obvious to one of ordinary skill in the art to have included the blocking capacitors of Moore ('432) in the receive circuitry of Peterson ('945) and thereby achieve the claimed invention, in view of the teachings of Moore ('432).

**Regarding claims 10 and 11**, Peterson ('945) teaches a transducer array (col. 4 lines 53-54), a transmit section coupled through receive signal blocking circuitry to transmit transducer elements, a receive section input coupled to a multiplexed transducer element selected from the transmit transducer elements and adapted to be decoupled during operation of the transmit section (col. 5 lines 8-20), wherein the transmit section output drives the multiplexed transducer element during ultrasound beam transmission and where the receive section input receives a reception signal from the multiplexed transducer element during beam reception (col. 2 lines 50-57, col. 4 lines 31-34).

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Peterson ('945) does not teach that the transmit section is also coupled through a coupling capacitor to transmit transducer elements. In the same field of endeavor, Moore ('432) teaches a blocking capacitor 60 that effectively shields between the transmit and reception circuitry. It would have been obvious to one of ordinary skill in the art to have coupled the transmit section and transducer elements of Peterson ('945) via the blocking capacitor of Moore ('432) and thereby achieve the claimed invention, in order to minimize crosstalk between the transmission and reception lines.

**Regarding claims 12 and 24**, Peterson ('945) teaches that the receive signal blocking circuitry comprises low level signal blocking circuitry (col. 5 lines 26-32).

**Regarding claims 4, 13 and 25**, Moore ('432) teaches clamping diodes 55 in the transmit blocking circuitry (Fig. 3).

**Regarding claims 5 and 26**, Moore ('432) teaches back-to-back diodes coupled to the transmit section input and output, as well as clamping diodes coupled to the transmit section input and output (Fig. 3; Examiner notes that, so long as two elements are part of the same circuit, they are effectively "coupled").

**Regarding claims 6, 7, 15 and 16**, Peterson ('945) teaches back-to-back diodes coupled between multiple transducer elements, wherein the diodes form a short circuit between the elements during transmit (col. 7 lines 7-10). The diodes of Peterson ('945) also form an open circuit during reception.

**Regarding claims 8 and 27**, Moore ('432) teaches clamping diodes 55 coupled to the receive section input and output, as well as back-to back and clamping diodes 55 coupled to the receive section input and output (col. 2 lines 14-15, Fig. 3).

**Regarding claim 9**, Peterson ('945) teaches a voltage step up circuit coupled between the transmit section input and transmit section output (col. 7 lines 50-54).

**Regarding claim 14**, Peterson ('945) teaches transmit signal blocking circuitry coupled to the receive section output as previously discussed for claim 1.

**Regarding claims 17 and 18**, the transmit array of Peterson ('945) comprises a 2 x 2 patch of transmit transducer elements (col. 4 lines 49-54).

**Regarding claim 19**, the multiplexed transducer element of Peterson ('945) is part of a two-dimensional array (col. 4 lines 49-50), which inherently must comprise at least a 2x2 array of four elements, from which three elements can be arbitrarily designated as a "triangular receive aperture comprised of selected array transducer elements". is included in a triangular receive aperture comprised of selected array transducer elements.

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**Regarding claim 20**, neither Peterson ('945) nor Moore ('432) teach that the receive aperture comprises five sections having five, four, three, two and one element (s), respectively. Applicant has not disclosed that this size and arrangement of receive aperture sections solves a particular problem or presents a patentable advantage over the prior art. Furthermore, it has previously been held that merely changing the size and/or arrangement of known elements is obvious and unpatentable over the prior art (*In re Rose* , 220 F.2d 459, 105 USPQ 237 (CCPA 1955); *In re Dailey*, 357 F.2d 669, 149 USPQ 47 (CCPA 1966); *In re Japikse*, 181 F.2d 1019, 86 USPQ 70 (CCPA 1950)). Accordingly, it would have been obvious to one of ordinary skill in the art to have used a receive aperture having five sections of five, four, three, two and one element (s), respectively, in the system of Peterson ('945) as modified by Moore ('432), and thereby achieve the claimed invention, as such a modification requires nothing more than changing the size and arrangement of known receive aperture elements.

### ***Response to Arguments***

7. Applicant's arguments filed 27 June 2007 have been fully considered but are moot in view of the new grounds of rejection presented herein.

### ***Conclusion***

Any inquiry concerning this communication or earlier communications from the examiner should be directed to PARIKHA S. MEHTA whose telephone number is (571)272-3248. The examiner can normally be reached on M-F, 8 - 4:30pm.

If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, Brian Casler can be reached on 571.272.4956. The fax phone number for the organization where this application or proceeding is assigned is 571-273-8300.

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Information regarding the status of an application may be obtained from the Patent Application Information Retrieval (PAIR) system. Status information for published applications may be obtained from either Private PAIR or Public PAIR. Status information for unpublished applications is available through Private PAIR only. For more information about the PAIR system, see <http://pair-direct.uspto.gov>. Should you have questions on access to the Private PAIR system, contact the Electronic Business Center (EBC) at 866-217-9197 (toll-free). If you would like assistance from a USPTO Customer Service Representative or access to the automated information system, call 800-786-9199 (IN USA OR CANADA) or 571-272-1000.

/Ruth S. Smith/

Primary Examiner, Art Unit 3737

/Parikha S Mehta/

Examiner, Art Unit 3737